

CLAIMS:

1. A security system, comprising:
a security tag to attach to an item, said security tag having an outer wall; and
a detaching device having at least one driver rod, said driver rod penetrating said outer wall to detach said security tag from said item.
2. The security system of claim 1, wherein said detaching device includes two driver rods.
3. The security system of claim 2, wherein said security tag comprises:
a tack body;
a security tag to receive said tack body;
a clamp disposed within said security tag to retain said tack body; and
5 wherein said driver rod bends said clamp beyond a yield point to release said tack body.
4. The security system of claim 3, wherein said clamp includes a concave surface, said concave surface having a first angle when said clamp retains said tack body, and a second angle when said clamp releases said tack body.
5. The security system of claim 4, wherein said first angle comprises an angle from a set of angles comprising 146-180 degrees.
6. The security system of claim 4, wherein said first angle comprises an angle of approximately 164 degrees.
7. The security system of claim 4, wherein said second angle comprises an angle from a set of angles comprising 90-145 degrees.
8. The security system of claim 4, wherein said second angle comprises an angle of approximately 105 degrees.

9. The security system of claim 1, wherein said outer wall comprises a thickness that may be penetrated by approximately 5 to 15 pounds of force received from said driver rod.

10. The security system of claim 1, wherein said outer wall comprises a plastic material with a thickness of approximately 0.01 to 0.024 inches.

11. The security system of claim 3, wherein said outer wall has at least one aperture after said clamp is bent.

12. The security system of claim 3, wherein said security tag comprises an upper housing and a lower housing, said lower housing having a protrusion with said outer wall, said outer wall having two access points to allow penetration by said driver rods to bend said clamp.

13. The security system of claim 12, wherein said clamp comprises a center portion and two end portions, with said upper housing having an abutment positioned above said center portion to provide resistance against said clamp while said driver rods contact each end portion to bend said clamp towards said abutment.

14. The security system of claim 3, wherein said detaching device comprises:
a rotor having a nest and concentric aperture to receive and hold a first end of said security tag, said rotor to rotate from a first position to a second position in response to force applied to a second end of said security tag, said rotor having a plurality of apertures;
5 said driver rods, with each driver rod having a first end positioned within a corresponding aperture and a second end having a bearing assembly and a bearing wheel;
a plurality of curved ramps positioned to assist movement of said first ends of said driver rods through said apertures and toward said first end of said security tag as said second ends of said driver rods move along said ramps during said rotation; and
10 a top cover to inhibit vertical movement of said rotor during said rotation.

15. The security system of claim 14, wherein force is received by said second end of said security tag to rotate said rotor from said first position to said second position, said rotation applying force to said first ends of said driver rods thereby moving said second ends of said

driver rods along said ramps, with said movement causing said first ends of said driver rods
5 to move through said apertures towards said first end of said security tag until said first ends
of said driver rods penetrate said outer wall to bend said clamp beyond said yield point.

16. The security system of claim 15, wherein force is received by said second end of said
security tag to rotate said rotor from said second position to said first position, said rotation
applying force to said first ends of said driver rods thereby moving said second ends of said
driver rods along said ramps, with said movement causing said first ends of said driver rods
5 to move through said apertures away from said first end of said security tag until said first
ends of said driver rods withdraw from said outer wall.

17. The security system of claim 14, wherein each curved ramp includes an up ramp and a
down ramp, with said bearing wheels to bear against and roll up said up ramp to assist
movement of said first ends of said driver rods towards said first end of said security tag, and
said bearing wheels to bear against and roll down said down ramp to assist movement of said
5 first ends of said driver rods away from said first end of said security tag.

18. The security system of claim 14, wherein said first end of said security tag comprises
a tag head and a protrusion with said outer wall, with said nest to receive and hold said tag
head to assist said rotation, and said concentric aperture to receive said protrusion to allow
said driver rods to access said outer wall.

19. The security system of claim 14, wherein said detaching device further comprises:
a locking bar;
said rotor having a side wall with an aperture to receive said locking bar; and
wherein said locking bar to receive force to move said locking bar through said
5 aperture from a first position to a second position, with said locking bar in said second
position to prevent rotation of said rotor.

20. The security system of claim 14, wherein said detaching device further comprises a
locking bar, with said locking bar to receive force to move said locking bar through said
concentric aperture from a first position to a second position, with said locking bar in said
second position preventing said rotor from receiving said first end of said security tag.

21. A security tag, comprising:
 - a tack body;
 - a security tag to receive said tack body; and
 - a clamp disposed within said security tag to retain said tack body, said clamp to

5 receive force sufficient to bend said clamp beyond a yield point and release said tack body.
22. The security tag of claim 21, wherein said clamp includes a concave surface, said concave surface having a first angle when said clamp retains said tack body, and a second angle when said clamp releases said tack body.
23. The security tag of claim 22, wherein said first angle comprises an angle from a set of angles comprising 146-180 degrees.
24. The security tag of claim 22, wherein said first angle comprises an angle of approximately 164 degrees.
25. The security tag of claim 22, wherein said second angle comprises an angle from a set of angles comprising 90-145 degrees.
26. The security tag of claim 22, wherein said second angle comprises an angle of approximately 105 degrees.
27. The security tag of claim 21, wherein said outer wall comprises a thickness that may be penetrated by approximately 5 to 15 pounds of force.
28. The security tag of claim 21, wherein said outer wall comprises a hard plastic material with a thickness of approximately 0.01 to 0.024 inches.
29. The security tag of claim 21, wherein said outer wall has at least one aperture after said clamp is bent.

30. The security tag of claim 21, wherein said security tag comprises an upper housing and a lower housing, said lower housing having a protrusion with said outer wall, said outer wall having two access points to allow penetration by a pair of corresponding objects to bend said clamp.

31. The security tag of claim 30, wherein said clamp comprises a center portion and two end portions, with said upper housing having an abutment positioned above said center portion to provide resistance against said clamp while said driver rods contact each end portion to bend said clamp towards said abutment.

32. A detaching device, comprising:

a rotor having a nest and concentric aperture to receive and hold a first end of a security tag, said rotor to rotate from a first position to a second position in response to force applied to a second end of said security tag, said rotor having a plurality of apertures;

5 said driver rods, with each driver rod having a first end positioned within a corresponding aperture and a second end having a bearing assembly and a bearing wheel; a plurality of curved ramps positioned to assist movement of said first ends of said driver rods through said apertures and toward said first end of said security tag as said second ends of said driver rods move along said ramps during said rotation; and

10 a top cover to inhibit vertical movement of said rotor during said rotation.

33. The detaching device of claim 32, wherein said security tag includes a tack body, a security tag and a clamp disposed therein to retain said tack body, and force is received by said second end of said security tag to rotate said rotor from said first position to said second position, said rotation applying force to said first ends of said driver rods thereby moving said 5 second ends of said driver rods along said ramps, with said movement causing said first ends of said driver rods to move through said apertures towards said first end of said security tag until said first ends of said driver rods penetrate said outer wall to bend said clamp beyond a yield point to release said tack body.

34. The detaching device of claim 33, wherein force is received by said second end of said security tag to rotate said rotor from said second position to said first position, said rotation applying force to said first ends of said driver rods thereby moving said second ends

of said driver rods along said ramps, with said movement causing said first ends of said
5 driver rods to move through said apertures away from said first end of said security tag until
said first ends of said driver rods withdraw from said outer wall.

35. The detaching device of claim 32, wherein each curved ramp includes an up ramp and
a down ramp, with said bearing wheels to bear against and roll up said up ramp to assist
movement of said first ends of said driver rods towards said first end of said security tag, and
said bearing wheels to bear against and roll down said down ramp to assist movement of said
5 first ends of said driver rods away from said first end of said security tag.

36. The detaching device of claim 32, wherein said first end of said security tag
comprises a tag head and a protrusion with said outer wall, with said nest to receive and hold
said tag head to assist said rotation as force is applied to said second end of said security tag,
and said concentric aperture to receive said protrusion to allow said driver rods to access said
5 outer wall.

37. The detaching device of claim 32, wherein said detaching device further comprises:
a locking bar;
said rotor having a side wall with an aperture to receive said locking bar; and
wherein said locking bar to receive force to move said locking bar through said
5 aperture from a first position to a second position, with said locking bar in said second
position to prevent rotation of said rotor.

38. The detaching device of claim 32, wherein said detaching device further comprises a
locking bar, with said locking bar to receive force to move said locking bar through said
concentric aperture from a first position to a second position, with said locking bar in said
second position preventing said rotor from receiving said first end of said security tag.

39. A security system, comprising:
a security tag comprising a tack body, a security tag and a clamp disposed within said
security tag to retain said tack body, said clamp to receive force sufficient to bend said clamp
beyond a yield point and release said tack body;
5 a monitoring system to detect said security tag; and

an alert system to communicate an alert if said monitoring system detects said security tag.

40. The security system of claim 39, wherein said security tag includes an outer wall, and further comprising a detachment device having driver rods to detach said security tag from an item by having said driver rods penetrate said outer wall to bend said clamp.

41. The security system of claim 39, wherein said security tag also includes a sensor emitting signals at a certain frequency, and wherein said monitoring system comprises a transceiver to detect said signals.

42. A security tag, comprising:

a tack body;

a security tag to receive said tack body; and

5 a clamp disposed within said security tag to retain said tack body, said clamp to receive force from at least one driver rod to bend said clamp beyond a release point and release said tack body.

43. The security tag of claim 42, wherein said clamp has a first position to retain said tack body, and a second position to release said tack body, with said second position moving to said first position after said clamp releases said tack body.

44. The security tag of claim 42, wherein said security tag further comprises an outer wall, said outer wall having at least one aperture to receive said driver rod and allow said driver rod to contact said clamp to apply said force.

45. The security tag of claim 42, wherein said security tag further comprises an outer wall, said outer wall to be penetrated by said driver rod to contact said clamp to apply said force.

46. A detaching device, comprising:
at least one driver rod; and
a driver rod activator to move said driver rod through an outer wall of a security tag
to bend a clamp to a release point and detach said security tag from an item.
47. The detaching device of claim 46, wherein said driver rod activator comprises a motor
to move said driver rod.
48. The detaching device of claim 46, wherein said driver rod activator receives manual
force to move said driver rod.
49. The detaching device of claim 46, wherein said driver rod activator comprises a rotor
to receive manual force to move said driver rod.